



[7590-01-P]

**NUCLEAR REGULATORY COMMISSION**

**[Docket Nos. 72-1030, 72-56; 50-338 and 50-339]**

**[NRC-2012-0084]**

**Independent Spent Fuel Storage Installation, Virginia Electric and Power Company,  
North Anna Power Station Units 1 and 2**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Issuance of an environmental assessment and finding of no significant impact.

**FOR FURTHER INFORMATION CONTACT:** Jennie Rankin, Project Manager, Division of Spent Fuel Storage and Transportation, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone: (301) 492-3268; Fax number: (301) 492-3342; email: [jennivine.rankin@nrc.gov](mailto:jennivine.rankin@nrc.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Introduction**

The Nuclear Regulatory Commission (NRC or Commission) is considering issuance of a one-time exemption to Virginia Electric and Power Company (Dominion or licensee) pursuant to 10 CFR 72.7 from the requirements of 10 CFR 72.212(b)(3) and the portion of 72.212(b)(11) which requires compliance with the terms, conditions, and specifications of the CoC. Dominion submitted its exemption request by letter dated July 21, 2011, as supplemented September 28,

2011. Dominion has loaded spent nuclear fuel into Transnuclear, Inc. (TN) NUHOMS® HD Storage System (HD-32PTH) dry storage casks, under the Certificate of Compliance (CoC or Certificate) No. 1030, Amendment No. 0. The licensee inadvertently reversed the upper and lower zones while preparing the dry shielded canister (DSC) loading maps. This resulted in twelve fuel assemblies being loaded into seven DSCs with decay heat greater than the levels specified in the CoC. Dominion requests a one-time exemption to the 10 CFR Part 72 requirements to continue storage of the affected DSCs with serial numbers DOM-32PTH-004-C, -005-C, -007-C, -010-C, -013-C, -019-C and GBC-32PTH-011-C in their current condition at the Independent Spent Fuel Storage Installation (ISFSI) associated with the operation of Dominion's nuclear power reactors, North Anna Power Station Units 1 and 2, located in Louisa County, Virginia.

## **II. Environmental Assessment (EA)**

*Identification of Proposed Action:* The CoC is the NRC approved design for each dry storage cask system. The proposed action would grant Dominion a one-time exemption from the requirements of 10 CFR 72.212(b)(3) and from the portion of 72.212(b)(11) that states the licensee shall comply with the terms, conditions, and specifications of the CoC, to the extent necessary to enable Dominion to continue storage of the seven DSCs in their current condition at the ISFSI associated with North Anna Power Station Units 1 and 2. These regulations specifically require storage of spent nuclear fuel under a general license in dry storage casks approved under the provisions of 10 CFR Part 72, and compliance with the terms and conditions set forth in the CoC for each dry spent fuel storage cask used by an ISFSI general licensee.

The TN NUHOMS® HD dry cask storage system CoC provides requirements, conditions and operating limits in Attachment A, Technical Specifications (TS). The TS restrict the decay heat in lower Zone “1a” locations to  $\leq 1.05$  kW and the upper Zone “1b” locations to  $\leq 0.8$  kW. The applicant inadvertently reversed the upper and lower zones while preparing the DSC loading maps. This resulted in twelve fuel assemblies being loaded into seven DSCs (serial numbers DOM-32PTH-004-C, -005-C, -007-C, -010-C, -013-C, -019-C and GBC-32PTH-011-C) with decay heat greater than specified in the CoC. The maximum decay heat of the misloaded fuel assemblies at the time of loading was 0.859 kW, which exceeded the Zone “1b” limit mentioned above by 59 watts. Currently, the twelve affected fuel assemblies have been in storage for a minimum of 1.3 years and have decayed to meet the required decay heat limits of the CoC.

The proposed action would grant Dominion a one-time exemption from the requirements of 10 CFR 72.212(b)(3) and the portion of 72.212(b)(11) which requires compliance with the terms, conditions, and specifications of a CoC, in order to allow continued storage of the seven affected DSCs in their current condition. This exemption approval is only valid for DSCs with serial numbers DOM-32PTH-004-C, -005-C, -007-C, -010-C, -013-C, -019-C and GBC-32PTH-011-C, at the North Anna Power Station ISFSI.

*Need for the Proposed Action:* Dominion requested this exemption in order to continue storage of seven as-loaded DSCs containing twelve fuel assemblies which exceeded the CoC decay heat limits at the time of loading. Dominion, with the assistance of TN, has provided an evaluation and thermal analysis which shows that the affected DSCs remain bounded by the system’s design basis limits and that the continued storage of the fuel in the as-loaded configuration is safe.

Dominion has considered an alternative to the proposed action, which would correct the condition by reloading the affected DSCs to be in compliance with CoC No. 1030. This would involve retrieving each of the DSCs from their Horizontal Storage Modules (HSM), unloading the spent fuel assemblies from the DSC, performing inspections of various DSC components, reloading the spent fuel assemblies into the used DSC or a new DSC (if there was damage noted on the used DSC) in accordance with CoC No. 1030, performing the DSC closing procedures, and transferring the DSC back to the ISFSI for re-insertion into the HSM.

Dominion estimates this alternative action of loading and unloading operations would increase personnel exposures by 250 mRem per affected DSC. In addition, Dominion states the alternative to the proposed action would generate radioactive contaminated material and waste during loading and unloading operations and disposal of the used DSCs if the DSCs were damaged during the unloading process. The licensee estimates the alternative to the proposed action would cost an estimated \$300,000 for unloading and reloading operations of each affected DSC and also necessitate additional fuel handling operations. If the DSC was damaged during unloading, the licensee estimates an additional \$1,000,000 for purchase of a new DSC and \$200,000 for disposal of the used DSC.

The proposed action is necessary to document the acceptability and safety basis for storage of the DSCs in the as-loaded configuration, thus precluding the need to unload the seven DSCs.

*Environmental Impacts of the Proposed Action:* The NRC staff has determined that the proposed action would not endanger life or property. The potential impact of using the

NUHOMS® HD dry cask storage system was initially presented in the Environmental Assessment (EA) for the rulemaking to add the TN NUHOMS® HD Horizontal Modular Storage System for Irradiated Nuclear Fuel to the list of approved spent fuel storage casks in 10 CFR 72.214 (71 FR 25740, dated May 2, 2006 (Direct Final Rule), and 71 FR 71463, dated December 11, 2006 (Final Rule)).

The licensee submitted TN Calculation No. 10494-174, which performed bounding thermal analysis using ANSYS finite element software to evaluate the misloading events. The licensee concluded the maximum fuel cladding temperature for the as loaded DSCs remained below the fuel cladding temperature limit used in the Updated Safety Analysis Report dated October 2, 2009. The NRC staff performed an independent safety evaluation of the proposed exemption and determined that loading of the spent nuclear fuel with higher than allowable decay heat loads did not exceed the structural and shielding design basis and that the fuel cladding temperatures are below the temperature limit at the time of loading. The fuel assemblies have since decayed to meet the CoC limits. There are no changes being made in the types or amounts of any radiological effluents that may be released offsite, and there is no significant increase in occupational or public radiation exposure as a result of the proposed activities. Therefore, there are no significant radiological environmental impacts associated with the proposed action. The proposed action only affects the requirements associated with the fuel assemblies already loaded into the casks and does not affect non-radiological plant effluents, or any other aspects of the environment. Therefore, there are no significant non-radiological impacts associated with the proposed action.

Accordingly, the Commission concludes that there are no significant environmental impacts associated with the proposed action.

*Alternative to the Proposed Action:* Because there is no significant environmental impact associated with the proposed action, alternatives with equal or greater environmental impact were not evaluated. As an alternative to the proposed action, the NRC staff considered denial of the proposed action which would involve reloading the affected DSCs as described previously. Denial of the exemption would result in an increase in radiological exposure to workers, a small potential for radioactive releases to the environment due to radioactive material handling, additional opportunities for accidents, and increased cost to the licensee. Therefore, the NRC staff has determined that approving the proposed action has a lesser environmental impact than denying the proposed action.

*Agencies and Persons Consulted:* The environmental assessment associated with this exemption request was sent to Ms. Ellie Irons of the Virginia Department of Environmental Quality in the Office of Environmental Impact Review, by letter dated November 14, 2011 (ML113180477). The state response was received by letter dated December 14, 2011 (ML120030312). The letter states that the proposed action is unlikely to have significant effects on ambient air quality, historic resources, surface waters, and wetlands. The letter also states that it is unlikely to adversely affect species of plants or insects listed by state agencies as rare, threatened, or endangered. Furthermore, the Virginia Department of Health considered the alternative to the proposed action of reloading the casks presents several risks, namely additional radiation exposure to workers and potential accidents that may lead to dispersal of radiation to the environment. Thus, the Virginia Department of Health states that it supports the exemption without reservation. The NRC staff has determined that a consultation under Section 7 of the Endangered Species Act is not required because the proposed action will not affect listed species or a critical habitat. The NRC staff has also determined that the proposed action

is not a type of activity having the potential to cause effects on historic properties. Therefore, no consultation is required under Section 106 of the National Historic Preservation Act.

### **III. Finding of No Significant Impact**

The environmental impacts of the proposed action have been reviewed in accordance with the requirements set forth in 10 CFR Part 51. Based upon the foregoing Environmental Assessment, the Commission finds that the proposed action of granting the one-time exemption from the requirements of 10 CFR 72.212(b)(3) and the portion of 72.212(b)(11) which requires compliance with the terms, conditions, and specifications of the CoC in order to allow Dominion to store spent fuel assemblies in DSCs with serial numbers DOM-32PTH-004-C, -005-C, -007-C, -010-C, -013-C, -019-C and GBC-32PTH-011-C in the as-loaded configuration at the ISFSI associated with North Anna Power Station Units 1 and 2, will not significantly impact the quality of the human environment. Accordingly, the Commission has determined that an environmental impact statement for the proposed exemption is not warranted and that a finding of no significant impact is appropriate.

### **IV. Further Information**

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," final NRC records and documents regarding this proposed action are publicly available in the records component of NRC's Agencywide Documents Access and Management System (ADAMS). The request for exemption dated July 21, 2011 (ML11208C453), as supplemented September 28, 2011

(ML11286A143), was docketed under 10 CFR 50, Docket Nos. 50-338 and 50-339, and under 10 CFR 72, Docket No. 72-56. These documents may be inspected at NRC's Public Electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. These documents may also be viewed electronically on the public computers located at the NRC's Public Document Room (PDR), O1F21, One White Flint North, 11555 Rockville Pike, Rockville, MD, 20852. The PDR reproduction contractor will copy documents for a fee. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC PDR Reference staff by telephone at 1-800-397-4209, or (301) 415-4737, or by e-mail to [pdrc@nrc.gov](mailto:pdrc@nrc.gov).

Dated at Rockville, Maryland, this 26th day of March, 2012.

For the Nuclear Regulatory Commission.

**/RA/**

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